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EXAMINER

TSAI, HENRY

ART UNIT PAPER NUMBER

2183

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/833,578

Applicant(s)

APISDORF ET AL.

Examiner

Henry W.H. Tsai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/23/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-45 is/are allowed.
- 6) ☐ Claim(s) is/are rejected.
- 7) ☐ Claim(s) is/are objected to.
- 8) ☐ Claim(s) are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date .
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date .
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

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DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: at page 34, line 4, "904A" should read -902A-.

Appropriate correction is required.

Claim Objections

2. Claims 11, 36, and 41 are objected to because of the following informalities:

In clam 11, line 2, before "memory", -a- should be inserted;

In clam 36, line 2, before "memory", -a- should be inserted; and

In clam 41, line 2, before "memory", -a- should be inserted.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 15, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 15, "said update generator" lacks proper antecedent basis since it was not mentioned previously in the claims.

In claim 20, "said update generator" lacks proper antecedent basis since it was not mentioned previously in the claims.

Applicant is required to review the claims and correct all language which does not comply with 35 U.S.C. § 112, second paragraph.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Olnowich (U.S. Patent No. 6,044,438) (hereafter referred to as Olnowich'438).

Referring to claim 1, Olnowich'438 discloses, as claimed, an apparatus (see Figs. 1A and 1B) for forwarding data between processing elements, comprising: a first processing element (34 node in other network, see Fig. 1A), said first processing element including an update-transmit element (SEND ADAPTER 14, see Fig. 1B, note node 34 in other network comprises the elements same as that shown in Fig. 1B for node 30); a forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) coupled to said update-transmit element (SEND ADAPTER 14, see Fig. 1B, note node 34 in other network comprises the elements same as that shown in Fig. 1B for node 30); and a second processing element (30, the node shown in Fig. 1B) coupled to said forwarding storage element, said second processing element including: a register (such as data register 602, or 604, see Fig. 15D), and an address register (such as 691, 692, 693, or 694, see Fig. 18A).

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Referring to claim 14, Olnowich'438 discloses, as claimed, an apparatus (see Figs. 1A and 1B) for forwarding data between processing elements, comprising: a first processing element (30, the node shown in Fig. 1B) including an address register (such as 691, 692, 693, or 694, see Fig. 18A), a first memory address (the address in 826 B, see Fig. 18A) being stored in said address register; a forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) coupled to said first processing element; and a second processing element (34 node in other network, see Fig. 1A) coupled to said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B), said second processing element (34 node in other network, see Fig. 1A) transmitting a second memory address (the address in 826A, see Fig. 18A) to said forwarding storage element, said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) transmitting the second memory address (the address in 826A, see Fig. 18A) to said first processing element (30, the node shown in Fig. 1B); said first processing element (30, the node shown in Fig. 1B) comparing (by using COMPARE 800A-800D, see Fig. 18A) the second memory address (the address in 826A, see Fig. 18A) with the first memory address (the address in 826 B, see Fig. 18A).

Referring to claim 31, Olnowich'438 discloses, as claimed, a method (see Figs. 1A and 1B) for reducing data retrieval,

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latencies in a multiple processing element environment, comprising: receiving (through RECEIVE ADAPTER 12 and RECEIVE FIFO, 44-46, see Fig. 1B), at a first processing element (30, the node shown in Fig. 1B), update data (the data send from node 34) forwarded from a second processing element (34 node in other network, see Fig. 1A), the update data including data relating to operations performed at the second processing element; retrieving (the processor 50 (note the second processing element, node 34 in other network, see Fig. 1A and the first processing element, node 30, share the memory 54, see Fig. 1B, and see col. 11, lines 14-16, the nodes are tightly coupled) retrieves and uses the received data through data bus see Fig. 2A) data from the update data in order to execute an instruction at the first processing element (as set forth above, the second processing element, node 34 in other network, see Fig. 1A and the first processing element, node 30, share the memory 54, see Fig. 1B, and see col. 11, lines 14-16, the nodes are tightly coupled); and revising (such as the data in shared memory 54 are to be revised after execution in processor 50 of node 30) a subset of the received update data in response to the execution of the instruction on the first processing element (30, the node shown in Fig. 1B).

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Referring to claim 39, Olnowich'438 discloses, as claimed, a method (see Figs. 1A and 1B) for forwarding data between processing elements, comprising: storing first memory address (the address in 826B, see Fig. 18A) to an address register (such as 691, 692, 693, or 694, see Fig. 18A) at a first processing element (30, the node shown in Fig. 1B); retrieving a second memory address (the address in 826A, see Fig. 18A) associated with a second processing element (34 node in other network, see Fig. 1A) from a forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B); comparing (by using COMPARE 800A-800D, see Fig. 18A) the second memory address with the first memory address; and updating a data register (such as data register 602, or 604, see Fig. 15D) at the first processing element (30, the node shown in Fig. 1B) with a data value from the second processing element (34 node in other network, see Fig. 1A) in response to said comparing.

As to claims 2 and 16, Olnowich'438 also discloses: said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) is a first-in first-out storage element.

As to claims 3 and 17, Olnowich'438 also discloses: said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) is a queue.

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As to claim 4, Olnowich'438 also discloses: said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) receives a first memory address (the address in 826A, see Fig. 18A) from said update-transmit element (SEND ADAPTER 14, see Fig. 1B, note node 34 in other network comprises the elements same as that shown in Fig. 1B for node 30) and said second processing element (30, the node shown in Fig. 1B) compares (by using COMPARE 800A-800D, see Fig. 18A) the first memory address (the address in 826A, see Fig. 18A) in said forwarding storage element with a second memory address (the address in 826B, see Fig. 18A) in said address register (such as 691, 692, 693, or 694, see Fig. 18A).

As to claims 5 and 19, Olnowich'438 also discloses: said second processing element stores data from said forwarding storage element to the register of said second processing element based on the comparison of the second memory address with the first memory address (see Col. 28, lines 48-55. Also note the remote store is based on the address comparison by COMPARATOR 650, see Fig. 15B).

As to claims 6 and 21, Olnowich'438 also discloses: said first processing element and said second processing element is disposed within a telecommunications switch (see switch interconnection network 20 in Fig. 1A).

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As to claim 7, Olnowich'438 also discloses: said second processing element stores data from said update-transmit element to the register of said second processing element (note this is the situation when the remote store request is sent from the first processing element and based on the address comparison by COMPARATOR 650, see Remote read/store message generation 630 in Fig. 15B).

As to claims 8, 15, and 22, Olnowich'438 also discloses: said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) includes a data field (such as data fields for WORW COUNT 819 or MEMORY AREA 815 inside message header 128A, see Fig. 7) and an address field (such as memory address field 818, see also col. 36, lines 49-50).

As to claims 9 and 23, Olnowich'438 also discloses: said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) includes a last-update flag (certainly a last-update flag is used in the FIFO replacement algorithm).

As to claims 10 and 24, Olnowich'438 also discloses: said forwarding storage element includes a time-to-live field (TIME STAMP filed 817 inside message header 128A, see Fig. 7, see also col. 36, lines 49-55).

As to claim 11, Olnowich'438 also discloses: said first processing element writes the data to memory (such as the shared

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memory 54, see Fig. 1B) shared by said first processing element and said second processing element.

As to claims 12, Olnowich'438 also discloses: a shared memory (such as the shared memory 54, see Fig. 1B)).

As to claims 13, 30, 38, and 45, Olnowich'438 also discloses: a third processing element (another node 34 in another network, see Fig. 1A) coupled to said first processing element (34 node in other network, see Fig. 1A), said first processing element sending a signal (such as ACCEPT control signal in 61 as shown in Fig. 3) to said third processing element indicating that said third processing element may access a memory (54, see Fig. 1B) shared between said first processing element and said third processing element (note the first processing element, node 34 in other network, see Fig. 1A and the third processing element, another node 34, share the memory 54, see Fig. 1B, col. 8, lines 8-16, and col. 11, lines 14-16, the nodes are tightly coupled)).

As to claim 18, Olnowich'438 also discloses: said first processing element (30, the node shown in Fig. 1B) includes a data register (such as data register 602, or 604, see Fig. 15D), said first processing element (30, the node shown in Fig. 1B) storing data associated with a memory address (the address in

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826A, see Fig. 18A) from said forwarding storage element to said data register (such as data register 602, or 604, see Fig. 15D).

As to claim 20, Olnowich'438 also discloses: as best understood, said update generator transmits a data value (word count 819, see Fig. 7) and associated memory address (memory address 818, see Fig. 7) to said forwarding storage element

As to claim 25, Olnowich'438 also discloses: said first processing element (30, the node shown in Fig. 1B) includes said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B).

As to claim 26, Olnowich'438 also discloses: said second processing element (node 34 in other network) includes said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B). Note node 34 in other network comprises the elements same as that shown in Fig. 1B for node 30.

As to claim 27, Olnowich'438 also discloses: said forwarding storage element (SEND FIFO 40, 41, or 42, see Fig. 1B) is separate from said first processing element and said second processing element. Note node 34, different from nodes 30 and 34 set forth above, in another network comprises the elements, such as SEND FIFO 40, 41, or 42, see Fig. 1B same as that shown in Fig. 1B for node 30.

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As to claim 28, Olnowich'438 also discloses: said first processing element and said second processing element are included in a ring of processing elements (since a plurality of nodes 39, and 34 communicate via messages sent over an switch interconnection network 20 in Fig. 1A certainly will be disposed in a ring).

As to claim 29, Olnowich'438 also discloses: said first processing element is adjacent to said second processing element in a ring of processing elements (since a plurality of nodes 39, and 34 communicate via messages sent over an switch interconnection network 20 in Fig. 1A).

As to claim 32, Olnowich'438 also discloses: forwarding the revised subset of the update data a third processing element (note this is the situation when the remote store/read request is sent from the first processing element or the second processing element, see Remote read/store message generation 630 in Fig. 15B).

As to claim 33, Olnowich'438 also discloses: forwarding a subset of the received update data to a third processing element (note as set forth above, this is the situation when the remote store/read request is sent from the first processing element or the second processing element, see Remote read/store message generation 630 in Fig. 15B).

As to claim 34, Olnowich'438 also discloses: generating update data at the second processing element, and forwarding the generated update data to a third processing element (note as set forth above, this is the situation when the remote store/read request is sent from the second processing element after the execution thereof, see Remote read/store message generation 630 in Fig. 15B).

As to claim 35, Olnowich'438 also discloses: the update data is associated with a variable (such as the variable inside the shared memory 54, see Fig. 1B) shared by the first processing element and the second processing element.

As to claim 36, Olnowich'438 also discloses: the update data includes a memory address that is associated with memory (the shared memory 54, see Fig. 1B) shared by the first processing element and the second processing element.

As to claim 37, Olnowich'438 also discloses: decrementing a time-to-live value associated with the data value (best reasonably and broadly interpreted, since the time stamp 817 is related to the order of the time).

As to claim 40, Olnowich'438 also discloses: the data value is associated with a shared variable (in the shared memory 54, see Fig. 1B, and see also col. 11, lines 14-16).

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As to claim 41, Olnowich'438 also discloses: the first memory address and the second memory address are associated with memory (the shared memory 54, see Fig. 1B, and see also col. 11, lines 14-16) shared by the first processing element and the second processing.

As to claim 42, Olnowich'438 also discloses: identifying a validity (see v bits in 660A-660H, see Fig. 16, or v bits in 699A-699D, see Fig. 18A) of the data value.

As to claim 44, Olnowich'438 also discloses: the data value is associated with a particular network connection record (see Fig. 7, regarding destination node ID is contained in the message header 128B, and the specific nodes are related to a particular network connection).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gove'083 discloses Reconfigurable multi-processor operating in SIMD mode with one processor fetching instructions for use by remaining processors. The crossbar switch serves to establish the processor memory links and an inter-processor communication link

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allows the processors to communicate with each other for the purpose of establishing operational modes. Wilkinson et al.'915 discloses a SIMIMD array processing system. A partitionable section of the array containing several processing units are contained on a silicon chip arranged with "pickets", elements of the processing array, each preferably consisting of combined processing element with a local memory for processing bit parallel bytes of information in a clock cycle. Reckhter'841 discloses a technique for handling forwarding transients with link state routing protocol. As shown in Fig. 6, the packet may be forwarded over the path to the destination in Step 610 but only after decrementing a time-to-live or lifetime entry of a conventional network layer header of the packet (Step 608).

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Henry Tsai whose telephone number is (571) 272-4176. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner supervisor, Eddie Chan, can be reached on (571)

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272-4162. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC central telephone number, (571) 272-2100.

9. In order to reduce pendency and avoid potential delays, Group 2100 is encouraging FAXing of responses to Office actions directly into the Group at fax number: 703-872-9306. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2100 will be promptly forward to the examiner.



HENRY W. H. TSAI
PRIMARY EXAMINER

January 10, 2005